

IN THE CLAIMS:

Please amend claim 18 as follows. A marked-up copy of this claim is attached.

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18. (Amended) The method of purifying polluted soil according to claim 1 or 2, wherein the functional water has a pH of 4 to 10, an oxidation-reduction potential of 300 to 1100 mV, and a chlorine concentration of 2 to 100 mg/l.

REMARKS

The claims are 1-39, 56-60 and 63-66, with claims 1, 27, 65 and 66 being independent. Claim 18 has been amended to resolve minor informalities. No new matter has been added.

Applicants hereby affirm the election of Group I, claims 1-39, 56-60 and 63-65.

Claim 18 stands rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite. Applicants have amended claim 18 to address the Examiner's concerns. Accordingly, this rejection should be withdrawn.

Claims 2-26, 28-39, 56-60 and 63-65 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 6-12, 14-17, 25-30, 33-35, 37 and 38 of co-pending Application No. 09/335,711 and over claims 46-94 of co-pending Application No. 09/794,836.<sup>1</sup> These rejections are respectfully traversed.

<sup>1</sup>/This application issued as U.S. Patent No. 6,538,170 B2 on March 25, 2003.

The claims in the '711 application are related to irradiating a liquid with light while introducing gaseous pollutants into the liquid containing chlorine. Clearly, the claims in the '711 application do not teach or suggest a gaseous phase reaction to decompose pollutants heat-evaporated from soil. Therefore, the claims in the subject application are patentably distinct from the claims in the '711 application.

The claims in the '836 application do not disclose heating the soil to extract pollutants therefrom. The only specific recitation of a method for extracting pollutants from soil in the claims of the '836 application is in claim 49, which is directed to using a pit provided in the polluted soil and a vacuum pump to extract the gas containing the pollutant through the pit. Vacuum extraction without using heat is clearly different from the presently claimed invention. Therefore, clearly, the present claims are patentably distinct from the claims in the '836 application.

Claim 28-35, 37-39 and 65 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,813,799 (Calcote) in combination with U.S. Patent No. 5,308,507 (Robson). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to briefly review some of the key features and advantages of the presently claimed invention. The present invention is related to decomposing polluted soil. The pollutants are extracted by heating the soil, causing a pollutant-containing gas to be released therefrom. This pollutant-containing gas is then mixed with a chlorine-containing gas, which is obtained by aerating functional water, and the gaseous mixture is irradiated with light. The light irradiation of the mixed gas results in an efficient decomposition of pollutants, which were

initially contaminating soil. Thus, the present invention simultaneously solves two problems: decontaminating soil and decomposing pollutants.

In addition, since the decomposition reaction is carried out in a gas phase, chlorine radicals generated upon exposure to light are substantially more efficient in their action against pollutants that would be in a liquid phase. Accordingly, the present invention provides yet another important advantage over prior art.

Calcote is directed to removing pollutants from groundwater and soil by using heat. As acknowledged by the Examiner, this reference does not disclose or suggest how to decompose these released pollutants. The Examiner, however, alleged that Robson teaches all of the other presently claimed steps and an apparatus for their performance. Applicants respectfully disagree.

Robson is directed to the decomposition of an organic compound, such as trichloroethylene, by an oxidizing solution containing oxidants, such as ozone produced by an electrolysis of a salt solution. This reference also teaches that UV light may be used to aid the decomposition process. However, it is clear that the decomposition in Robson is carried out in a liquid and not in a gaseous phase (see col. 3, lines 18-21 and 50-52).<sup>2</sup> In fact, both the contaminants and the oxidants are in an aqueous solution.

There is not one iota of disclosure in Robson suggesting that decomposition should be conducted in a gas phase or that such decomposition would in any way be

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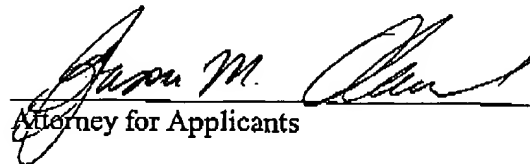
<sup>2</sup>/The Examiner will note that the electrolytic cell generating oxidants in a salt solution is by definition not a means for generating a gas containing chlorine. Neither the anode stream nor the cathode stream generated by this cell can be considered a gaseous mixture.

advantageous. Accordingly, it is clear that Robson cannot be combined with Calcote to disclose or suggest the presently claimed invention.

Wherefore, Applicants respectfully request that all outstanding rejections be withdrawn and that the present case be passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,

  
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APPENDIX

Application No. 09/741,332  
Attorney Docket No. 03500.014996

IN THE CLAIMS:

Claim 18 has been amended as follows:

18. (Amended) The method of purifying polluted soil according to claim 1 or 2, wherein the functional water has a [hydrogen ion concentration ([pH [value])] of 4 to 10, an oxidation-reduction potential [(working electrode: platinum electrode, reference electrode: silver-silver chloride electrode)] of 300 to 1100 mV, and a chlorine concentration of 2 to 100 mg/l.

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